

The Investigation of Job Search Behaviour Among Workers in the Manufacturing Sector in Malaysia: Do Education and Skill Mismatch Matter

Zainizam Zakariya^{#1}, Norimah Rambeli[@] Ramli^{#2}, Shahrul Nizam Abdul Aziz^{#3}, Norasibah Abdul Jali^{#4}, Nurul Sharniza Husin^{*5}

^{#1}Corresponding author

^{#1, 2, 3, 4}Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak, Malaysia

^{*}Universiti Utara Malaysia, Sintok, Kedah, Malaysia

¹zainizam@fpe.upsi.edu.my

²norimah@fpe.upsi.edu.my

³shahrul@fpe.upsi.edu.my

⁴norasibah@fpe.upsi.edu.my

⁵Nurul Sharniza@uum.edu.my

Abstract - This paper investigates the influence of education and skill mismatch on job search behaviour and quits intention among workers in the manufacturing sector in Malaysia. Three indicators of mismatch were employed here; over-education, overskilling and job mismatch and they were measured using workers' own assessment. Using data from own field survey, the 2016 Co-workers' Externalities at Workplace (TERS-16), it was found that 18%, 45% and 37% of respondents were deemed overeducated, overskilled and being in mismatched jobs, respectively. Using random effect probit models, three main findings were observed. As expected, there was strong evidence that overqualification resulted in job search activity. Being in jobs that completely different from workers' actual field of study also increased the likelihood of seeking new jobs relative to the reference group. Finally, being overskilled also led to a higher probability of being engaged in job search behaviour. Interestingly, the magnitude of the effect was twice higher for the severely than for the moderately-overskilled. These findings were robust even after all education-skill mismatch indicators were controlled for together. The results of the study reflect greater potential mobility amongst the mismatched workers in Malaysia. There is impossible to ascertain whether or not such a move results in improved matches due to data limitation. Yet, from a firm's perspective, higher intensity of job search behaviour among the mismatched may lead to a higher turnover rate and incur hiring and training cost.

Keywords: *overqualification, overskilling, job mismatch, job search, Malaysia*

1. Introduction

Previous studies related to education and skill mismatch have recognised that the mismatched workers tend to receive significantly lower earnings than their comparable well-matched workers review,

see [1]). The mismatched workers tend to be dissatisfied with their jobs compared to their appropriately matched counterparts [2], [3]. This raises the concern of whether education and skill mismatch workers have any real behavioural costs for workers, that is, whether the overeducated would remain at their present jobs or whether they lean towards looking new jobs elsewhere that corresponds to their educational background. Some studies suggest that overeducated workers are more likely to move into well-matched jobs in their consequent career [4]–[6]. Therefore, the overeducation is perceived as a transient incidence in the labour market for certain workers.

Moreover, according to [7], higher job turnover among workers seems a critical part of their drive toward the stable employment relations of established careers over time. This is because any of workers do not know deeply the nature of the job they got. Therefore, the job mobility would provide some opportunities for career improvement especially young workers as it is characterised by a shifting to fairly stable and good match and well-paid jobs in future [4]. Yet, an investigation of the time horizon of overeducation needs a panel dataset as the dataset allows researchers to track the career development of the overeducated worker. Nonetheless, an alternative way is via on-job search behaviour among the overeducated. On-the-job search behaviour can be defined as the cognitive process of thinking, planning, and intention to leave

current job and looking for new jobs whilst still employed [8].

Some earlier studies do indicate that whilst still employed, some workers are more likely to engage in job search activity at workplaces for a better job [9], [10]. It could be the case that the overeducated or overskilled workers might engage in job search behaviour while on working to find jobs that corresponding with their skills or education background. Quitting jobs and then starting to look for new jobs may make more difficult for the currently overeducated workers to obtain well-matched jobs due to the lack of access to the labour market information. Up to date, the study on this issue has gained more attention in developed countries [11]–[14]. There has almost no study investigate such incidence in developing countries, being an exception from [7]. Throughout the nation, this may be partly due to lack of on-the-job search information in the dataset which suggest that why the study on such issue remains unexplored among developing countries. Furthermore, the negative impact of over-education on job search in [7] may reflect respondents in the study were newly graduated from higher education institutions.

Fortunately, dataset utilised here does allow for the investigation of the relationship between not only over-education but also overskilling and how these phenomena impact on on-the-job search behaviour. If overskilling result in lower earnings outcomes and greater job dissatisfaction as found in other studies [2], [15]–[17], this would suggest that the overskilled workers might engage in job search activity in order to find jobs related to their actual skills. Therefore, exploring the career path of overeducated and overskilled workers are significant as greater job turnover amongst better-educated workers may reduce the effectiveness of organisations. Indeed, a higher turnover increases advertising, recruitment, selection and hiring expenses.

This paper consist of 5 section and the paper is structured as follows. Section 2 briefly presents available studies related to education-skill mismatch incidence and job search behaviour. Section 3 elaborates data utilised and information regarding on-the-job search activities and measurement of education-skill mismatch. Section 4 focuses on empirical techniques and followed up by the

empirical findings and discussions in Section 4 while Section 5 concludes.

2. Related Works

At least, there are two mechanisms can be used by workers who are employed in a job for which do not correspond to their actual education or skill background in improving their job matching quality. First, they may invest in additional on- or off-the-job training to compensate for their other types of human capital deficiencies especially work experience. Once they have gathered enough work experience and training as well, they might potentially be promoted into a job corresponding to their education either within or outside their workplaces. Sicherman and Galor (1990, 1991) using their Theory of Career Mobility investigated career mobility of the overeducated workers in the US using the 1976/1978 Panel Study of Income Dynamics (PSID) [4]. They found that the overeducated workers have a higher opportunity of being moved into a higher-level job than that of their well-matched counterparts. Similar results are also found in [5] and [6] in the US and the Netherlands, respectively where the overeducated workers significantly increased the probability of being promoted within firms relative to the well-matched workers.

Another mechanism to minimise such incidence is that by looking or search for another job while on working and this is a so-called on-the-job search as it provides the overeducated more access to labour market information whilst still on job, rather than being unemployed or quitting jobs, then looking for new jobs. This means that they might have to keep searching for new jobs until they find jobs that match to their skill or education background [19].

Apart from changing jobs, some studies focus on on-the-job search behaviour among the overeducated workers. Majority of the studies found positive linkages where the overeducated are more likely to engage in such activity at workplace. For example, Wolbers in a study across 13 European countries found that on-the-job search was positively and significantly associated with over-education incidence. The author found that job dissatisfaction among the overeducated led to a higher motivation for them to get jobs that matches their education and skills background [12]. Similarly, Wald discovered that overqualified Canadian graduates were between

7 and 15% higher probability of being searched another job than that of their well-matched counterparts [13]. Di Pietro and Urwin in Italy found that job search behaviour was likely for both the overeducated and undereducated than the well-matched workers [20]. Yet, the magnitude of effects was greater for the overeducated than the undereducated. This might be partly due to the fact that the overeducated are relatively more dissatisfied and greater earnings loss, hence, more desperate to change jobs than the undereducated. Yet, Allen and van der Valden found no evidence of job search activity among the overeducated, instead, they found the overskilled who were more likely to engage in such activity relative to the adequately-matched worker [11].

From the developing country study, previous study finds on-the-job search activity among graduate in Malaysia was higher among the mismatched, especially for the severely than for the moderately mismatched workers [7]. Therefore, there is still more could be explored offered from the developing countries perspective. Whilst there has been tremendously increased in the quantity of education for each level, there has however been disappointment surrounding with respect to the lack of labour demand to absorb the increased supply of highly educated workers and resulted on higher unemployment among graduates [21].

3. Methodology

This study employs our own survey namely the 2016 Co-Workers Externalities Survey (CWES-16). The survey was carried out in 2016 and was funded by the Ministry of Higher Education (MoE) under the Fundamental Research Grant Scheme (FRGS).

3.2 Sample and Sampling Technique

A total of 160 manufacturing firms across Klang Valley were randomly selected and for each firm, about 25 respondents aged between 15 and 64 years old were randomly selected by human resource department to take part for the survey. However, only 103 firms successfully returned the questionnaire with a total of 2,479 respondents. Moreover, a total of 144 respondents from 6 firms were removed from the analysis due to incomplete information related to main variables. This resulted

in a final sample of 2,335 respondents covering 96 firms in the manufacturing sector.

3.3 Data Collection Procedure

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3.4 Data Descriptive

Table 1 shows the main characteristics of the sample and in general, male forms the majority of the respondents (57%) and respondents were roughly younger on average 31 years old. A large portion of respondents possesses a diploma, MCE/SPM and university qualifications with the corresponding figures of 27%, 23% and 21% respectively. Respondents on average have accumulated 13 years of work experience and over 70% have ever attended training at the workplace. With respect to other demographic backgrounds, married respondents and Malay/Bumiputeras form a large proportion in the sample whereas respondents spend about 14km travel to and from workplaces. Regarding job characteristics, skilled and clerical/non-production workers represent more than one-fifth each in the sample and on average, respondents spend about 41 working hours each week.

Table 1 Characteristics of key variables (Mean and standard deviation)

Key variables	Mean	SD
Gender		
Male	0.566	
Female	0.434	
Age	31.33	7.63
Years of schooling completed (S_i)	12.84	4.31
Highest qualification obtained		
Informal	0.04	
UPSR	0.01	
LCE/SRP/PMR	0.05	

MCE/SPM	0.23				aspects of job satisfaction dimension, being the exception for satisfaction with pay with the mean score of less than 3.5.
HCE/STPM	0.16				
Diploma	0.27			The	The 2016 TERS contains information key variables used in the study, i.e. measurements of education-skill mismatch and information on the on-the-job search behaviour and intention to leave among employed respondents. In this paper, education-skill mismatch was determined via the workers' own assessment (WA) via the following questions:
University qualification (bachelor's degree onwards)	0.21				
Others	0.02				
Work experience (year)	12.55	8.39			
Received training at workplaces (train)					
Yes	0.73				
No	0.37				
Marital status					i. According to you, what is the most appropriate level of qualification for the work you are doing?
Married	0.56				ii. According to you, what is the most appropriate field of education for the work you are doing?
Widow/Separated	0.05				iii. Your current job offers you sufficient scope to use your knowledge and skills.
Bachelor	0.38				
Race				The	There were seven qualification levels to choose from in question one: 1 (degree) to 7 (no qualification). For question two, four options were available: 1 (only my own field); 2 (related to my field); 3 (completely different from my field); and 4 (no specific fields are required for this job). The last statement came with a five-likert scale from 1 (do not agree at all) to response 5 (agree completely). Table 2 shows the responses for question one (top panel), question two (mid panel) and statement 3 (bottom panel). With respect to question one, about 29% of workers believed that the diploma was the most appropriate qualification requirement and followed by university qualification (21%).
Malay and bumiputeras	0.61				
Chinese	0.21				
Indian	0.12				
Others	0.07				
Work distance in km (workdist)	13.63	11.47			
Occupation					
Management	0.16				
Professional	0.11				
Skilled workers	0.24				
Clerical/Non-production workers	0.22			For	For the statement 2, only 15% of respondents believed that the most appropriate field of education was their own specific field of education while 40% believed that it was related to their field. Around 45% of respondents reported being employed in a job unrelated to their field of education (either completely different or no specific field is required). Finally, about 63% of respondents agreed or completely agreed that current jobs offer them sufficient scope to use their knowledge and skills. Only 29% of them somewhat agree and another 8% disagreed.
Unskilled workers	0.11				
Elementary workers	0.12				
Others	0.05				
Tenure (year)	5.90	5.78			
Hours of work per week (hrswork)	41.4	14.2			
Union (union)	0.44				
Monthly income (RM)	2195.3	1490.4			
Job satisfaction dimension					
Satisfaction with job (satis)	3.62	0.99			
Satisfaction with promotion opportunities (prom)	3.60	0.96			
Satisfaction with pay (pay)	3.48	1.02			
Overall satisfaction (overall)	3.61	1.02			

Finally, respondents earn about RM2,200 per month. Lastly, respondents seem satisfied in almost all

Table 2 Required education and skill in current job (%)

Statement 1	%
<i>According to you, what is the most appropriate field of education for the work you are doing?</i>	
None/Informal	3.82
UPSR	3.82
LCE/SRP/PMR	4.47
MCE/SPM	19.85
HCE/STPM/Certificate	18.68
Diploma	28.58
University qualification	20.79
Total	100.0

Statement 2	
<i>According to you, what is the most appropriate field of education for the work you are doing now?</i>	
Only my own field of study	15.05
Related to my field of study	39.77
Completely different from my field of study	21.22
No specific field of study is required	23.96
Total	100.00

Statement 3	
<i>My current job offers me sufficient scope to use my knowledge and skills</i>	
Do not agree at all	2.58
Do not agree	4.92
Somewhat agree	29.45
Agree	49.17
Agree completely	13.88
Total	100.00

Based on the information in Table 2, it allows us to create indicators of education-skill mismatch. First, by comparing the survey respondents' actual qualification (see Table 1) with the perceived qualification requirement for the job (question one), we derived conventional estimates of overqualification. Where an individuals' actual qualification exceeds what the job requires, they are considered to be overqualified. Where an individuals' actual level of qualification is below that required for the job they are classified as underqualified. Those who's actual and required qualification are similar, there are deemed as well-matched.

With respect to question two, individuals working outside their own field (i.e. completely different and no specific field required) are considered as being in mismatch job following (Zakariya, "Wage Effect of Over-Education and Mismatch in Malaysia: A

Random Effect Approach"). In comparison, well-matched workers are those who reported that their field of education exactly matched or was related to the job they were doing. With respect to statement 3, respondents with 1 and 2 on the scale are classified as severely overskilled, 3 are moderately overskilled, and 4 and 4 are well-matched. As such, 19%, 45% and 37% of respondents as presented in Table 3 are classified as overqualified, mismatch and overskilled (29.5% moderately overskilled and 7.5% are severely overskilled) workers, respectively.

Table 3 Incidence of education-skill mismatch (%)

Education-skill mismatch indicators	%
Overqualification incidence	
Well-qualified	57.50
Overqualified	19.18
Underqualified	23.32
Total	100.00
Job mismatch (mismatch by field of study)	
Well-matched	0.55
Mismatch	0.45
Total	100.00
Overskilling incidence	
Severely overskilled	7.50
Moderately overskilled	29.45
Adequately matched	63.05
Total	100.00

For the latter, respondents were asked about whether they were actively looking for other jobs as follows "Are you currently actively looking for another job outside the company?". The question came with a yes or no response. It was estimated that one-third of respondents were actively involved in on-the-job search behaviour relative to 67% who did not.

Table 4 specifically explores the incidence of job search behaviour across education-skill mismatch indicators. Those who engaged in job search activity were predominantly among the mismatched whereas those who in a well-matched job were less likely to look for another job. For example, whilst on average 33% of workers were actively seeking a new job, the figure was much higher for the overqualified than for the well-matched counterparts (41% against 31%).

Table 4 Job search behaviour by education-skill mismatch indicators (mean)

Education-skill match indicators	Mean
Qualification match	
Well-matched	0.312
Overqualified	0.411
Underqualified	0.310
Total	0.331
Mismatch	
Only my own field of study	0.221
Related to my field of study	0.278
Completely different from my field of study	0.414
Total	0.331
Skill match	
Severely-overqualified	0.441
Moderately-overqualified	0.348
Adequately matched	0.310
Total	0.331

3.5 Empirical Method

Let us begin by setting out a simple utility maximisation decision following [22]. Mismatched workers might equate the utility they gain from their current job, V^c , to the utility they might gain in another job, V^f . Thus, the tendency to quit the current job would be greater if the present value of the V^c is lower than the present value of the V^f once any possible mobility cost (C) has been considered, that is, $V^c < V^f - C$. The function of the V^c can be written as $V^c = V(q, ic, ja, y, js...)$ where q denotes the job match indicators, ic is workers' characteristics, ja represents job traits, y and js correspond to earnings and job satisfaction each.

Due to nature of the dataset is in hierarchical form where workers were clustered into larger units, i.e. establishments), this means that workers in the same establishment share to some degree similar traits when compared with those from other establishments. Given the fact that not all these traits can empirically be observed, it follows that the disturbances might be correlated [23], [24]. In this case, the assumption of independence is violated. Therefore, following Rodríguez and Elo (2003) and Bland and Cook (2019), we employed random

effects probit model where we assume that conditional on unobserved random effects μ_i , the outcomes are realisations of independent Bernoulli random variables Y_{ij} with probabilities depending on μ_i . Specifically, we assume that the conditional probability of a positive outcome given the random effect μ_i is

$$Y_{i,j}^* = \alpha + X_{i,j}\beta + \epsilon_{i,j} + \mu_i$$

$$Y_{i,j} = \begin{cases} 1 & \text{if } Y_{i,j}^* \geq 0 \\ 0 & \text{if } Y_{i,j}^* < 0 \end{cases} \quad Y_{i,j} = \begin{cases} 1 & \text{if } Y_{i,j}^* \geq 0 \\ 0 & \text{if } Y_{i,j}^* < 0 \end{cases} \quad (1)$$

$$(2)$$

where $Y_{i,j}^*$ is the unobserved latent variable, i.e. - the probability of being engaged in job search behaviour and quit intention for individual i at firm j . $Y_{i,j}$ is the observed binary dependent variable, $X_{i,j}$ is a $1 \times K$ vector of data, β is a $K \times 1$

vector of coefficients, $\epsilon_{i,j}$ is an iid idiosyncratic error term, and μ_i is a mean-zero error term specific to the individual level of panel. We assume that $\epsilon_{i,j}$ is iid standard normal and parametric distribution of μ_i ; it is standard to assume that $\mu_i \sim iidN(0, \sigma_u^2)$. Then, β , σ_u^2 and σ_u^2 are jointly estimated using maximum likelihood.

Equation (2) can be rewritten using the latent variable representation as [26]:

$$\Pr(Y_{i,j}^* \geq 0 | X_{i,t}) = \Pr(\alpha + X_{i,j}\beta + \epsilon_{i,j} + \mu_i \geq 0 | X_{i,t})$$

$$\Pr(Y_{i,j} \geq 0 | X_{i,t}) = \Pr(\alpha + X_{i,j}\beta + \epsilon_{i,j} + \mu_i \geq 0 | X_{i,t}) \quad (3)$$

$$= E[I(\alpha + X_{i,j}\beta + \epsilon_{i,j} + \mu_i \geq 0 | X_{i,t})]$$

$$= E[I(\alpha + X_{i,j}\beta + \epsilon_{i,j} + \mu_i \geq 0 | X_{i,t})] \quad (4)$$

$$= \int_{-\infty}^{\infty} \Phi(\alpha + X_{i,j}\beta + \mu) \frac{\phi(\frac{\mu}{\sigma_u})}{\sigma_u} d\mu$$

$$= \int_{-\infty}^{\infty} \Phi(\alpha + X_{i,j}\beta + \mu) \frac{\phi(\frac{\mu}{\sigma_u})}{\sigma_u} d\mu \quad (5)$$

where equation (5) eliminates $\epsilon_{i,j}\epsilon_{i,j}$ using the normal cdf and integrates out $\mu \sim N(0, \sigma_u^2)$. Since $\epsilon_{i,j}\epsilon_{i,j}$ and $\mu_{i,j}\mu_{i,j}$ are both independent normal random variable, it follows that $\epsilon_{i,j} + \mu_{i,j}$ is also normally distributed with mean

$$E[\epsilon_{i,j} + \mu_{i,j}] = E[\epsilon_{i,j}] + E[\mu_{i,j}] = 0$$

$$E[\epsilon_{i,j} + \mu_{i,j}] = E[\epsilon_{i,j}] + E[\mu_{i,j}] = 0$$

and variance

$$V[\epsilon_{i,j} + \mu_{i,j}] = V[\epsilon_{i,j}] + V[\mu_{i,j}] = 1 + \sigma_u^2$$

$$V[\epsilon_{i,j} + \mu_{i,j}] = V[\epsilon_{i,j}] + V[\mu_{i,j}] = 1 + \sigma_u^2$$

Hence,

$$Z = -\frac{\epsilon_{i,j} + \mu_{i,j}}{\sqrt{1 + \sigma_u^2}} \sim N(0,1)$$

substituting

$$Z = -\frac{\epsilon_{i,j} + \mu_{i,j}}{\sqrt{1 + \sigma_u^2}} \sim N(0,1)$$

into (3) yields:

$$\Pr(Y_{i,j}^* \geq 0 | X_{i,t}) = \Pr(\alpha + X_{i,j}\beta - Z\sqrt{1 + \sigma_u^2} \geq 0)$$

$$\Pr(Y_{i,j}^* \geq 0 | X_{i,t}) = \Pr(\alpha + X_{i,j}\beta - Z\sqrt{1 + \sigma_u^2} \geq 0 | X_{i,t}) \quad (6)$$

$$= \Pr\left(Z \leq \frac{\alpha + X_{i,j}\beta}{\sqrt{1 + \sigma_u^2}} | X_{i,j}\right)$$

$$= \Pr\left(Z \leq \frac{\alpha + X_{i,j}\beta}{\sqrt{1 + \sigma_u^2}} | X_{i,j}\right) \quad (7)$$

which is the standard normal cdf evaluated at $\frac{\alpha + X_{i,j}\beta}{\sqrt{1 + \sigma_u^2}}$. Hence:

$$\Pr(Y_{i,j} = 1 | X_{i,t}) = \Phi\left(\frac{\alpha + X_{i,j}\beta}{\sqrt{1 + \sigma_u^2}}\right)$$

$$\Pr(Y_{i,j} = 1 | X_{i,t}) = \Phi\left(\frac{\alpha + X_{i,j}\beta}{\sqrt{1 + \sigma_u^2}}\right) \quad (8)$$

4. Findings and Discussion

Table 5 presents the results of random effects probit models of job search determinants among employed respondents. There are four model specifications examined. In the first specification, we controlled for overqualification together with individuals' human capital endowments, job attributes and job satisfaction. In the second specification, the mismatch is replaced for the overqualification whereas, in specification 3, we replace education mismatch with overskilling indicators. In the final specification, both educational and skill mismatch measures are included together. Before discussing the results, we should acknowledge that the output includes the additional panel-level variance component, which is parameterised as the log of the variance, $\ln(\text{lnsig2u})$ in the output. The rho (J) across model is in between 0.342 and 0.366 refers to the proportion of the total variance contributed by the panel-level variance component. This means that the panel-level variance component is important, and the panel estimator is preferable than the standard probit or pooled estimator. Moreover, the likelihood-ratio test across models all are significant, indicating that the random effect probit estimator is better than the probit estimator.

We discussed briefly other controlled variables on the determinants of job search behaviour. Looking first at individuals' human capital characteristics, there is no evidence across models that schooling (yrsch) and training (train) on job search behaviour. This seems not in line with other studies that found a positive relationship between education and job-seeking [11,12,17]. Instead, there is weak evidence of work experience is negatively associated with job search behaviour (only Model 2 and 4). This indicates that being longer in the labour market reduces workers' probability of being engaged in the job search. This finding seems in line with other studies where fewer experience workers usually take 'stepping-stone' jobs on their way to search for better jobs; hence, more mobile and likely to change jobs [14, 33, 34].

For demographic background, as expected, we find evidence across models that females are 14 – 15% less likely to be engaged in job search activity compared to their males' counterparts. Chinese ethnic is also less likely to look for another job while on working that that of Malay counterparts (reference group). Instead, the likelihood of being in

job search behaviour is greater among other ethnic groups. There was no evidence of marital status, the number of kids and work distance on job search behaviour.

With respect to job attributes, the results show that tenure and being a union member are not significantly associated with job search activity. By contrast, there is weak evidence of longer working hours per week increases the likelihood of being searched for a new job. Yet, the evidence is only observed in Model 2 and Model 4. As expected, workers who were employed in the clerical/non-

production are about 21 to 27 percentage points more likely to look for another job compared to workers in managerial jobs (reference group). This evidence is observed across all models. For this, previous studies [10, 14, 17] found that the job search behaviour is prevalent among workers in low-level than managerial jobs. Regarding earnings, the coefficient on the log of monthly income is negative but not statistically regardless of specification. As such, income has not significantly impact on job search behaviour among workers.

Table 5 Determinants of job search behaviour - random effects probit model

Job search (0 = No, 1 = Yes)	Model 1	Model 2	Model 3	Model 4
Human capital endowments				
Years of schooling completed (yrsch)	0.0103 (0.0138)	0.0150 (0.0136)	0.0144 (0.0137)	0.0124 (0.0139)
Work experience (exp)	-0.0185 (0.0150)	-0.0258* (0.0151)	-0.0192 (0.0151)	-0.0267* (0.0153)
Work experience square (exp ²)	0.0002 (0.0004)	0.0004 (0.0004)	0.0002 (0.0004)	0.0004 (0.0004)
Training attended (train)	0.0353 (0.0911)	0.0424 (0.0909)	0.0515 (0.0915)	0.0733 (0.0921)
Demographic backgrounds				
Female	-0.1478** (0.0736)	-0.1512** (0.0734)	-0.1406* (0.0737)	-0.1476** (0.0741)
Race (Malay as ref group)				
Chinese	-0.2477*** (0.0927)	-0.2461*** (0.0923)	-0.2231** (0.0924)	-0.2731*** (0.0936)
Indian	0.0629 (0.1071)	0.0447 (0.1075)	0.0670 (0.1073)	0.0453 (0.1085)
Others	-0.9156*** (0.3127)	-0.9085*** (0.3140)	-0.8539*** (0.3112)	-0.9064*** (0.3202)
Marital status (Married as ref group)				
Widow/separated	0.0280 (0.1448)	-0.0273 (0.1453)	0.0026 (0.1453)	-0.0295 (0.1464)
Single	0.3076*** (0.0980)	0.3070*** (0.0978)	0.3016*** (0.0981)	0.3032*** (0.0990)
No. of kids (kids)	-0.0539	-0.0544*	-0.0544*	-0.0561*

	(0.0329)	(0.0328)	(0.0330)	(0.0332)
Wok distance in minutes (distmin)	0.0053	0.0057*	0.0059*	0.0061*
	(0.0034)	(0.0034)	(0.0034)	(0.0034)
Job characteristics				
Job tenure (tenure)	0.0093	0.0072	0.0083	0.0076
	(0.0075)	(0.0075)	(0.0075)	(0.0076)
Hours of work per week (hrswork)	0.0053*	0.0046	0.0057*	0.0044
	(0.0031)	(0.0031)	(0.0031)	(0.0031)
Union (union)	0.0067	-0.0011	-0.0021	-0.0360
	(0.0907)	(0.0902)	(0.0903)	(0.0910)
Occupation (Managerial as ref group)				
Professional	-0.2086	-0.1821	-0.1822	-0.1714
	(0.1398)	(0.1397)	(0.1400)	(0.1411)
Skilled workers	-0.0097	-0.0315	0.0056	0.0138
	(0.1211)	(0.1201)	(0.1213)	(0.1228)
Clerical/Non-production workers	0.2553**	0.2147*	0.2416*	0.2679**
	(0.1257)	(0.1254)	(0.1256)	(0.1278)
Unskilled workers	0.1155	0.0664	0.1728	0.0972
	(0.1677)	(0.1678)	(0.1673)	(0.1726)
Elementary	0.2871*	0.2140	0.2835*	0.2351
	(0.1601)	(0.1624)	(0.1614)	(0.1657)
Others	-0.0418	-0.1744	-0.0919	-0.0740
	(0.1921)	(0.1922)	(0.1923)	(0.1959)
Loginc	-0.1840	-0.1400	-0.1676	-0.0834
	(0.1192)	(0.1188)	(0.1195)	(0.1218)
Satisfaction dimension				
Satisfaction with job (satis)	-0.0731	-0.0279	-0.0398	-0.0300
	(0.0999)	(0.0999)	(0.1001)	(0.1011)
Satisfaction with promotion opportunities (prom)	0.1016	0.1259	0.1343	0.1266
	(0.0985)	(0.0980)	(0.0988)	(0.0993)
Satisfaction with pay (pay)	-0.3560***	-0.3931***	-0.3666***	-0.3590***
	(0.0909)	(0.0900)	(0.0903)	(0.0914)
Table 5 Determinants of job search behaviour - random effects probit model (<i>continued</i>)				
Overall satisfaction (overall)	-0.3449***	-0.3418***	-0.3402***	-0.3313***
	(0.0942)	(0.0940)	(0.0942)	(0.0949)

Qualification match (Well-matched as ref group)

Overqualification	0.1494*	0.0825
	(0.0875)	(0.0889)
Underqualification	-0.1203	-0.1597*
	(0.0873)	(0.0889)

Job match (Well-matched s ref group)

Related to my field	0.1964	0.1885
	(0.1196)	(0.1214)
Completely different from my field	0.4720***	0.4504***
	(0.1190)	(0.1215)

Skill match (Severely-overskilled as ref group)

Moderately overskilled			-0.2614**	-0.2447*
			(0.1315)	(0.1332)
Adequately matched skill			-0.4433***	-0.3936***
			(0.1270)	(0.1295)
Constant	1.0048	0.4450	1.1278	0.3320
	(0.9739)	(0.9799)	(0.9678)	(1.0006)

Insig2u				
Constant	-0.5811***	-0.6536 ***	-0.5499**	-0.5864***
	(0.2152)	(0.2185)	(0.2137)	(0.2169)
N	2301	2313	2313	2301
No. of group	96	96	96	96
Average sample for each group	24	24	24	24
Log-likelihood	-1083.8	-1084.9	-1088.1	-1067.7
Wald Chi-square (Wald- χ^2)	227.52	241.19	234.87	251.832
p-value	0.000	0.000	0.000	0.000
rho (ρ)	0.3587	0.3422	0.3659	0.3575
LR test of rho (χ^2)	213.54	193.91	222.54	202.441

The effects of job satisfaction on job search are mixed and depend on job satisfaction facets. First, there was no evidence found with respect to satisfaction with job and promotion opportunities across all models. By contrast, there was strong evidence at 0.01 across models where greater satisfaction with pay and overall satisfaction reduce the probability of being involved in job search while on working. The findings seem to be in accordance with some studies in Malaysia [7], [27].

Turning now to our main interest, the bottom panel of Table 5 shows that the results support the argument that being in a mismatched job results in an increased intensity of on-the-job search activity. The results seem consistent regardless of how one measure education or skill mismatch indicators. Examine first Model 1, the coefficients on overqualification is 0.1494, i.e.- positive and statistically significantly different from zero at the 10% level. This means that there has weak evidence of the probability of seeking an alternative job is 15

percentage points higher for the overqualified than that of the reference group (the well-matched workers). Instead, there was no significant evidence of job search behaviour among the underqualified workers although the coefficient is negative.

In Model 2, we find no evidence that workers who were employed in jobs that somewhat related to their fields of education increase the likelihood of being engaged in job search activity as compared to the reference group, i.e.- those who were in jobs that corresponded to their own field of study. Instead, there was strong evidence at 0.01 that workers being in jobs that completely different from their field of the study raise the likelihood of seeking new jobs relative to the reference group. The magnitude of the effect is larger at 0.472 which implies that the intensity of job search activity is roughly 47% much higher for this group relative to the reference group. Indeed, the effect is larger than the effect of overqualification (Model 1). This might be due to being in jobs that totally different from own field of study result in more earnings penalty as found in other studies [28], [29], [30], [31].

In the third specification, the coefficients on both moderately and severely-overskilled dummies are positive and statistically significant at the 1% level. This implies that overskilling incidence leads to higher intensity of job search behaviour regardless of the degree of overskilling. The magnitude of effects, nonetheless, is more than twice higher for the severely than for the moderately-overskilled. The estimates demonstrate that, relative to the base group, the likelihood of being engaged in on-the-job search is 18 percentage points higher among the moderately with the corresponding figure of 44 percentage points for the severely-overskilled workers. Indeed, Wald-test rejects the hypothesis that the coefficients on moderately and severely-overskilled are all 0, indicating that the risk is indefinitely higher for the latter than for the former. This result seems in line with Allen and Velder in the Netherlands [11]

To see the results in Model 1, Model 2 and Model 3 are robust and remain consistent, all education-skill mismatch indicators are controlled for together as shown in the final specification. The results are almost similar to the previous three specifications. The only exception is that the significant impact of overqualification has now turned out to be

insignificant. In contrast, the insignificant effect of underqualification has now turned out to be significant but the evidence is weak at 0.1. Nevertheless, the coefficients on the completely different from my field, the moderately and severely-overskilled are a bit lower than Model 2 and Model 3. Again, our Wald tests that reject the coefficients on moderately, severely-overskilled and are completely different from my field all equal to 0. This indicates that being in jobs for which do not correspond to workers' own field of education and skill regardless of the degree of overskilling increase the workers' effort of being engaged in job search activity. We also should also acknowledge that the results with respect to other variables seem similar to the previous models, hence, the conclusion remains unchanged.

5. Discussion and Conclusion

In this paper, we examined how the education-skill mismatch literature associated with on-the-job search behaviour among employed individuals in the manufacturing sector in Malaysia. Preferably, one used to examine job mobility among the mismatched workers to determine whether the mismatch is transitory. Such analysis, yet, requires better dataset especially longitudinal panel data which is not readily available in Malaysia.

Using our own data survey, namely the TERS-16, roughly 18%, 45% and 37% of respondents were considered as being overeducated, overskilled and being in mismatched jobs, respectively. With regards to job search behaviour, roughly one-third of workers acknowledged that they were searching for another job while working. Yet, the figure was much higher among the mismatched workers, approximately between 41% and 44%.

We employed random effect probit models to determine whether on-the-job search behaviour was associated with education and skill mismatch. From the results, at least three major findings were observed. Firstly, as expected, there was strong evidence that overqualification led to job search activity. Second, workers who were employed in jobs that totally different from their own field of study increased the likelihood of seeking new jobs relative to the reference group. The magnitude of the size was larger for the mismatched than for the overqualified workers.

A priori, it is unclear how skill mismatch will affect the job search behaviour whether in terms of sign and magnitude horizon due to a very limited number of studies. This paper then found that overskilling workers also led to a higher risk of being engaged in on-the-job search behaviour. Interestingly, the magnitude of the effect was more than double for the severely than for the moderately-overskilled. Indeed, the impacts of both indicators remained higher and significant even after all education-skill mismatch indicators were controlled for together as illustrated in Model 4.

Results from this study may imply that once workers have ended up in the mismatched jobs, they tend to be dissatisfied with all aspects of their jobs, hence, may increase their intensity to look for another job and greater potential mobility amongst them. The results also seem strongly consistent with matching models of on-the-job search in predicting greater possible mobility amongst the mismatched workers. Whether such moves actually occur and whether they result in improved matches cannot be determined due to lack of information on current data.

While there could be a positive effort shown by the mismatched workers to increase the job matching, nonetheless, one should bear in mind that greater mobility amongst the mismatched does not guarantee a well-matched job. Indeed, the majority of overkilled workers who quit their jobs are not re-employed in jobs where their skills are well used and they mostly remain either in jobs where their skills are not adequately utilised or exit the workforce entirely [32]. However, if this supposition is correct, this may lead to a higher turnover rate at the firm level, hence, incur hiring cost.

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References

- [1] E. Leuven and H. Oosterbeek, "Overeducation and mismatch in the labor market," *Handb. Econ. Educ. Rev.*, no. 5523, pp. 1–56, 2011.
- [2] N. Sánchez-Sánchez and S. McGuinness, "Decomposing the impacts of overeducation and overskilling on earnings and job satisfaction: An analysis using REFLEX data," *Educ. Econ.*, vol. 23, no. 4, pp. 419–432, 2013.
- [3] A. Di Paolo and F. Mañé, "Misusing our talent ? among Spanish PhD graduates," *Econ. Labour Relations Rev.*, pp. 1–21, 2016.
- [4] N. Sicherman and O. Galor, "Overeducation in the labor market.," *J. Labor Econ.*, vol. 9, no. 2, pp. 101–22, 1991.
- [5] J. Hersch, "Optimal 'mismatch' and promotions," *Econ. Inq.*, vol. 73, no. 1, pp. 140–144, 1995.
- [6] S. Groeneveld and J. Hartog, "Overeducation, wages and promotions within the firm," *Labour Econ.*, vol. 11, no. 6, pp. 701–714, Dec. 2004.
- [7] Z. Zakariya, "Job Mismatch and On-the-job Search Behavior Among University Graduates in Malaysia," *Asian Econ. J.*, vol. 31, no. 4, pp. 355–379, 2017.
- [8] A. Kirschenbaum and J. Weisberg, "Job Search, Intentions, and Turnover: The Mismatched Trilogology," *J. Vocat. Behav.*, vol. 44, pp. 17–31, 1994.
- [9] J. Boudreau and W. Boswell, "Personality and cognitive ability as predictors of job search among employed managers," *Pers. Psychol.*, vol. 54, no. 1, pp. 25–50, 2001.
- [10] M. Ponzo, "On-the-job Search in Italian Labor Markets: An Empirical Analysis," *Int. J. Econ. Bus.*, vol. 19, no. 2, pp. 213–232, 2012.
- [11] J. Allen and R. van der Velder, "Educational mismatches versus skill mismatches: effects on wages, job satisfaction, and on-the-job search," *Oxf. Econ. Pap.*, vol. 53, no. 3, pp. 434–452, 2001.
- [12] M. H. J. Wolbers, "Job Mismatches and their Labour-Market Effects among School-Leavers in Europe," *Eur. Sociol. Rev.*, vol. 19, no. 3, pp. 249–266+ii, 2003.
- [13] S. Wald, "The impact of overqualification on job search.," *Int. J. Manpow.*, vol. 26, no. 2, pp. 140–156., 2005.
- [14] G. Di Pietro and P. Urwin, "Education and skills mismatch in the Italian graduate labour market," *Appl. Econ.*, vol. 38, no. 1, pp. 79–93, 2006.
- [15] S. Flisi, V. Goglio, E. C. Meroni, M. Rodrigues, and E. Vera-Toscano, "Measuring Occupational Mismatch: Overeducation and Overskill in Europe—Evidence from PIAAC," *Soc. Indic. Res.*, vol. 131, no. 3, pp. 1211–

- 1249, 2017.
- [16] S. Flisi, V. Goglio, E. Meroni, M. Rodrigues, and E. Vera-Toscano, *Occupational mismatch in Europe: Understanding overeducation and overskilling for policy making*. 2014.
- [17] Z. Zakariya, N. Abdul Jalil, and K. Yin Yin, "The Incidence and the Effect of Overskilling on Individuals' Wages in Malaysia: A Quantile Regression Approach," *J. Ekon. Malaysia*, vol. 51, no. 1, pp. 41–56, 2017.
- [18] N. Sicherman and O. Galor, "A theory of career mobility," *J. Polit. Econ.*, pp. 169–192, 1990.
- [19] A. Alba-Ramírez, "Mismatch in the Spanish Labor Market: Overeducation?" *J. Hum. Resour.*, vol. 28, no. 2, pp. 259–278, 1993.
- [20] A. Cutillo and G. Di Pietro, "The effects of overeducation on wages in Italy: a bivariate selectivity approach," *Int. J. Manpow.*, vol. 27, no. 2, pp. 143–168, 2006.
- [21] P. Glewwe and K. Muralidharan, "Improving Education Outcomes in Developing Countries: Evidence, Knowledge Gaps, and Policy Implications," in *Handbook of the Economics of Education*, 1st ed., vol. 5, E. Hanushek, S. Machin, & L. Woessmann (Eds.), Ed. Elsevier B.V., 2016, pp. 653–743.
- [22] H. Dickey, V. Watson, and A. Zangelidis, "Job satisfaction and quit intentions of offshore workers in the UK North Sea oil and gas industry," *Scott. J. Polit. Econ.*, vol. 58, no. 5, pp. 607–633, 2011.
- [23] Z. Zakariya and M. A. Mohd. Noor, "Workplace Characteristics and Determinants of Over-education and Overskilling in the Manufacturing Sector in Malaysia," *J. Pengur.*, vol. 40, pp. 125–136, 2014.
- [24] M. Wooden and B. Bora, "Workplace characteristics and their effects on wages: Australian evidence," *Aust. Econ. Pap.*, vol. 38, no. 3, pp. 276–289, 1999.
- [25] G. Rodríguez and I. Elo, "Intra-class Correlation in Random-effects Models for Binary Data," *Stata J.*, vol. 3, no. 1, pp. 32–46, 2003.
- [26] J. R. Bland and A. C. Cook, "Random effects probit and logit: understanding predictions and marginal effects," *Appl. Econ. Lett.*, vol. 26, no. 2, pp. 116–123, 2019.
- [27] C. Long and L. Thean, "Relationship Between Leadership Style, Job Satisfaction and Employees' Turnover Intention: A Literature Review.," *Res. J. Bus. Manag.*, vol. 5, no. 3, pp. 91–100, 2011.
- [28] J. Robst, "Overeducation And College Major: Expanding the Definition of Mismatch Between Schooling and Jobs," *Manchester Sch.*, vol. 76, no. 4, pp. 349–368, 2008.
- [29] M. Uzair-ul-Hassan and Z. Noreen, "Educational Mismatch between Graduates Possessed Skills and Market Demands in Pakistan," *Int. Educ. Stud.*, vol. 6, no. 11, pp. 122–129, 2013.
- [30] H. Lee, J. W. Lee, and E. Song, "Effects of Educational Mismatch on Wages in the Korean Labor Market *," *Asian Econ. J.*, vol. 30, no. 4, pp. 375–400, 2016.
- [31] S. J. Cabus and M. A. Somers, "Mismatch between education and the labour market in the Netherlands: is it a reality or a myth? The employers' perspective," *Stud. High. Educ.*, vol. 43, no. 11, pp. 1854–1867, 2018.
- [32] S. McGuinness and M. Wooden, "Overskilling, Job Insecurity, and Career Mobility," *Ind. Relations A J. Econ. Soc.*, vol. 48, no. 2, pp. 265–286, Apr. 2009.
- [33] Eriksson, S., & Gottfries, N. Ranking of job applicants, on-the-job search, and persistent unemployment. *Labour Economics*, 12(3), 407–428.
<https://doi.org/10.1016/j.labeco.2003.11.008>, 2005.
- [33] Carroll, D., & Tani, M. Job search as a determinant of graduate over-education: evidence from Australia. *Education Economics*, 23(5), 631–644.
<https://doi.org/10.1080/09645292.2014.908164>, 2015.